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**UNITED STATES DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/385,584 08/27/99 BALL

M 3817US- (97-1

EXAMINER

MMC2/0716

BRICK G POWER  
TRASK BRITT & ROSSA  
P O BOX 2550  
SALT LAKE CITY UT 84110

ABRAHAM, F  
ART UNIT

PAPER NUMBER

2826  
DATE MAILED:

07/16/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

09/ 385,584

Applicant(s)

Ball et al

Examiner

F. Abraham

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 6/4/01.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 33-37, 41-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) All is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e)

FETSUM ABRAHAM  
PRIMARY EXAMINER

## Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_
- 18) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

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**Final rejection**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 33-37,41-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwiebert et al (PN: 5,672,542)**

The reference discloses a solder mask (544) of uniform thickness (see figure 5) with multiple apertures (330) located to correspondingly ~~to~~ a contact pad location on a substrate upon which the pre-formed mask is to be deposited on or adhered (see abstract) to the substrate. Although the prior art calls the contact regions on the substrate as wettable regions on the substrate, it is clear that the expression indicated contact regions on the substrate. Further, the patent introduces different types of solder masks out of which one is a nonmetal polymer solder mask (see column 7, 40-45). This material is specifically addressed to be one of the preferred materials in page 5 of the specification, thus consistent with the invention. Furthermore, the patent teaches that the mask apertures are aligned with the wettable (bump) regions of a surface to receive bumps, clearly establishing the claimed invention.

As for claims 34,44, the structure has alignment holes on the mask and the substrate to align the apertures in both elements, clearly indicating that the peripheral regions of the contact pad are not involved.

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As for claims 35,45, the height of the apertures dictate terms as to the height of the conductive structures formed through the holes.

As for claims 37,47,55 the material characteristic claimed is possessed by the structure since it uses similar polymer material as the mask .

As for claims 51,53 most feedthrough contacts are made to be structures beyond the upper surface of the intermediate dielectric material in order to have a reasonable are of contact Although conductors are sometimes made to conform to the dielectric upper surface as shown by (PN: 5,880,017) to conserve material and processing time. In both cases, the choice is design oriented.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

**Refer PN: 5,880,017.**

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

**Examiner's response to applicant's argument**

Applicant argues that the prior art does not teach a nonmetal solder mask with at least one aperture. The argument, however is moot in view of the teachings in the prior art (see column 7, 18-25).

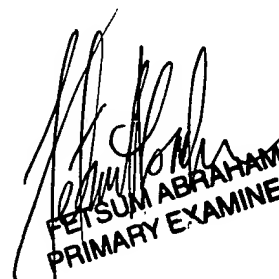
As for the aperture on a contact pad location, column 7, 40-45 of the patent clearly discloses the same claimed performance. In the paragraph, mask aperture is located on bump forming region for bump formation.

Any inquiry concerning this communication should be directed to Fetsum Abraham at telephone number (703) 305,3793, or by E-mail at [fetsum.abraham@uspto.gov](mailto:fetsum.abraham@uspto.gov).

Any inquiry of a general nature or relating to the status of this application should be directed to the *SPE of AU:2826* at (703)308-6601, or the *Group receptionist* at (703) 308-0956.

Fetsum Abraham

3/7/01

  
FETSUM ABRAHAM  
PRIMARY EXAMINER